

Appl. No.: 10/767,804
Amdt. Dated August 15, 2006
Reply to Office Action of May 15, 2006

This listing of claims will replace all prior versions, and listings, or claims in the application:

Claim listing:

1. (original) An electronic power switch for connecting a line-in to a line-out comprising:

a source of alternating current (AC) electrical power applied to the line-in, said alternating current including regularly spaced zero crossings between positive and negative going current pulses;

an electrically actuated power delivery device responsive to the presence of a gate signal to electrically connect the line-in to the line-out to deliver said alternating current to a load and in the absence of said gate signal to disconnect said line-in and line-out at the next zero crossing of said alternating current;

a power supply connected between said line-in and line-out to convert a portion of each positive and negative going current pulse to direct current (DC);

a capacitor arranged to store said direct current (DC);

a control device connected to receive direct current (DC) from said power supply and said capacitor, said control device responsive to an input to generate said gate signal and arranged to detect a predetermined voltage at a node in said power supply; and

a zero cross detector for detecting each zero cross of the alternating current (AC) and delivering a zero cross signal to said control device,

wherein said control device is responsive to said zero cross signal to remove said gate signal from said power delivery device, said power delivery device disconnecting said line-in from said line-out in the absence of said gate signal, and said power supply using an initial portion of each positive and negative going current pulse to charge said capacitor, said control device generating said gate signal upon detection of said predetermined voltage, said capacitor delivering direct current to said control device for the remainder of each current pulse.

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2. (original) The electronic power switch of claim 1, wherein said power supply comprises:

a pulse generator connected to said source of alternating current electrical power to divide a portion of said alternating current electrical power into first pulses of electrical energy;

a transformer having a primary coil and a secondary coil, said pulse generator connected to deliver said first pulses to said primary coil, said first pulses inducing second pulses of electrical energy in said secondary coil;

a circuit connected to receive said second pulses and convert said second pulses to direct current (DC);

3. (original) The electronic power switch of claim 2, wherein said pulse generator comprises a transistor oscillator circuit.

4. (original) The electronic power switch of claim 3, wherein said transistor oscillator circuit receives a feedback control signal from a coil of said transformer, said feedback control signal employed to control oscillation of said transistor oscillator circuit.

5. (original) The electronic power switch of claim 1, wherein said power delivery device comprises a triac.

6. (original) The electronic power switch of claim 1, wherein said power delivery device is optically coupled to said control device.

7. (original) An electronic power switch having an on state where electrical power is delivered to a load and an off state where electrical power is disconnected from the load comprising:

an electronic power delivery component responsive to a gate signal to deliver alternating current (AC) electrical power present on a line-in to a line-out, said

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alternating current (AC) including positive and negative going current pulses separated by regularly spaced zero crossings;

a control device for generating said gate signal in response to at least one input;
and

a power supply comprising:

a pulse generating circuit for generating pulses of electrical energy from each current pulse of said alternating current (AC);

a circuit for generating DC power for said control device, said power supply magnetically coupled to said pulse generating circuit; and

a power storage component for accumulating said DC power from said circuit and delivering said DC power to said control device over time,

wherein when said electronic power switch is in the on state, said control device removes said gate signal at each zero cross to allow said power supply to use an initial portion of each current pulse to charge said power storage device and upon detection of a predetermined voltage in said power supply, said control device restores said gate signal whereby a remainder of each current pulse is delivered through said electronic power delivery component to said line-out.

8. (original) The electronic power switch of claim 7, wherein said pulse generating circuit comprises a transistor oscillator circuit arranged to rectify and divide each said current pulse into said pulses of electrical energy.

9. (original) The electronic power switch of claim 7, wherein said power supply is magnetically coupled to said power supply by a transformer.

10. (original) The electronic power switch of claim 7, wherein said power supply is magnetically coupled to said circuit by a transformer and said pulse generating circuit is responsive to a feedback signal from a coil of said transformer.

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11. (original) A method for supplying power to a controller in an electronic power switch including an electronic component responsive to a gate signal to deliver alternating current carried by a line-in to a line-out, said alternating current (AC) including regularly spaced zero crossings between positive and negative going current pulses, said method comprising the steps of:

configuring said controller to delay actuation of the electronic component after each zero cross so that said electronic power delivery component does not deliver an initial portion of each current pulse to said line-out; and

using said initial portion of each current pulse to provide power to said controller.

12. (original) The method of claim 11, wherein said step of configuring comprises:

programming the controller to remove said gate signal in response to a zero cross trigger signal and to restore said gate signal in response to a voltage present trigger signal, said zero cross trigger signal corresponding to each zero cross of the alternating current and the voltage present trigger signal corresponding to a predetermined voltage level in a power supply circuit arranged to provide power to said controller.

13. (original) The method of claim 11, comprising the steps of:

providing a power supply circuit that uses a voltage differential present between said line-in and said line-out when said gate signal is removed from said electronic component to generate direct current DC power for use by said controller;

storing said direct current DC in a storage component;

generating the voltage present trigger signal upon detection of a predetermined voltage in said power supply circuit.

14. (original) The method of claim 11, wherein the step of using comprises storing power generated from the initial portion of each current pulse use by said controller after said gate signal is restored.